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File 434: SciSearch(R) Cited Ref Sci 1974-1989/Dec  
(c) 1998 Inst for Sci Info

| Set | Items   | Description       |
|-----|---------|-------------------|
| S1  | 1855    | RADISH() SEED?    |
| S2  | 1786097 | SIZE              |
| S3  | 996362  | AVERAGE           |
| S4  | 911226  | MILLIMETER? OR MM |
| S5  | 4       | S1 AND S2 AND S3  |
| S6  | 4       | RD (unique items) |

6/3,AB/1 (Item 1 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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03267233 Genuine Article#: NT236 Number of References: 46  
**Title: THE SIGNIFICANCE OF GENETIC EROSION IN THE PROCESS OF EXTINCTION .4.  
INBREEDING DEPRESSION AND HETEROSIS EFFECTS CAUSED BY SELFING AND  
OUTCROSSING IN SCABIOSA-COLUMBARIA** (Abstract Available)  
Author(s): VANTREUREN R; BIJLSMA R; OUBORG NJ; VANDELLEN W  
Corporate Source: UNIV GRONINGEN, DEPT GENET, KERKLAAN 30/9751 NN  
HAREN//NETHERLANDS//; NETHERLANDS INST ECOL, DEPT PLANT POPULAT BIOL/6666  
ZG HETEREN//NETHERLANDS/  
Journal: EVOLUTION, 1993, V47, N6 (DEC), P1669-1680  
ISSN: 0014-3820  
Language: ENGLISH Document Type: ARTICLE

Abstract: The effects of self-fertilization, within-population crosses (WPC) and between-population crosses (BPC) on progeny fitness were investigated in the greenhouse for *Scabiosa columbaria* populations of varying size. Plants grown from field collected seeds were hand pollinated to produce selfed, WPC, and BPC progeny. The performance of these progenies was examined throughout the entire life cycle. The different pollination treatments did not significantly affect germination, seedling-to-adult survival, flowering percentage and the number of flower heads. But severe inbreeding depression was demonstrated for biomass production, root development, adult survival, and seed set. Additionally, multiplicative fitness functions were calculated to compare relative fitnesses for progeny. On average, WPC progeny showed a more than 4-fold, and BPC progeny an almost 10-fold, advantage over selfed progeny, indicating that *S. columbaria* is highly susceptible to inbreeding. No clear relationship was found between population size and level of inbreeding depression, suggesting that the genetic load has not yet been reduced substantially in the small populations. A significant positive correlation was found between plant dry weight and total fitness. In two out of six populations, the differences between the effects of the pollination treatments on dry weight increased significantly when seedlings were grown under competitive conditions. This result is interpreted as an enhancement of inbreeding depression under these conditions. It is argued that improvement of the genetic exchange between populations may lower the probability of population extinction.

6/3,AB/2 (Item 2 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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00851355 Genuine Article#: FB607 Number of References: 56  
**Title: GENDER VARIATION IN BARTSIA-ALPINA (SCROPHULARIACEAE), A SUB-ARCTIC  
PERENNIAL HERMAPHRODITE** (Abstract Available)  
Author(s): MOLAU U  
Corporate Source: UNIV GOTEBOG, DEPT SYSTEMAT BOT, CARL SKOTTSBERGS GATA  
22/S-41319 GOTHENBURG//SWEDEN/  
Journal: AMERICAN JOURNAL OF BOTANY, 1991, V78, N3, P326-339  
Language: ENGLISH Document Type: ARTICLE  
Abstract: Maternal and paternal effects on seed size and reproductive success (RS) were studied in a subarctic population of *Bartsia alpina* L. (Scrophulariaceae), a hemiparasitic perennial herb forming dense clones in open habitats. The impact of environmental factors was assessed in fertilization and defoliation experiments, and gender specialization of individual genets was investigated in a series of diallel experiments (reciprocal crossings) in the field. Maternal effects on seed weight were much larger than paternal effects, and seed weight was also strongly influenced by resource availability

(especially nitrogen). The highest seed weights were usually found when genets were associated with *Astragalus frigidus*, which seems to be the optimal host species in the population, but similar results were achieved with NPK (nitrogen-phosphorus-potassium) fertilization. Defoliation experiments revealed an innate minimum seed weight, below which seed number was affected by resource deprivation. The reciprocal crossing program indicated a high level of gender specialization in individual genets (clones), ranging continuously from almost pure males to almost pure females. Early-flowering genets showed the highest **average** male RS, whereas female RS increased in late-flowering genets. Phenological separation of the genets into 'early' and 'late' revealed an inverse correlation between male and female performance. Numerous characters contributing to phenotypic gender were measured in the genets, but these characters and functional gender calculations from the diallel experiment were only weakly correlated. It is concluded that simultaneous measures of both male and female RS are needed for a reliable assessment of gender variation.

6/3,AB/3 (Item 1 from file: 98)  
DIALOG(R)File 98:General Sci Abs/Full-Text  
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04515432 H.W. WILSON RECORD NUMBER: BGSA01015432  
**Sources of phenotypic variation in floral traits in wild radish, *Raphanus raphanistrum* (Brassicaceae).**  
Williams, Jennifer L  
Conner, Jeffrey K  
American Journal of Botany (Am J Bot) v. 88 no9 (Sept. 2001) p. 1577-81  
SPECIAL FEATURES: bibl il ISSN: 0002-9122  
LANGUAGE: English  
COUNTRY OF PUBLICATION: United States  
WORD COUNT: 4690

ABSTRACT: Pollinator-mediated natural selection has been shown to act on phenotypic variation in floral morphology, and this variation has often been demonstrated to be heritable, but few details are available concerning the sources of floral variation. We examined phenotypic variation in seven floral traits in wild radish (*Raphanus raphanistrum*) at six levels: between two populations grown in a common garden, among plants within populations, among flowers measured on different weeks, between flowers on two flowering stalks measured on the same day, between adjacent flowers on a flowering stalk, and within individual flowers. There were no significant differences between plants derived from the two source populations, which were {similar}800 km apart. Most of the variance was within individual plants: repeatabilities were all <0.35. There were highly significant differences between flowers measured in different weeks and also highly significant plant by week interaction, indicating that the among-plant variation was not consistent over time. There was substantial variance among adjacent flowers on the same stalk, particularly in the gynoecium. This high within-plant variance is partly responsible for the low heritability of floral traits in the field and the weak selection on floral traits found in previous studies of wild radish. Reprinted by permission of the publisher.

6/3,AB/4 (Item 2 from file: 98)  
DIALOG(R)File 98:General Sci Abs/Full-Text  
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04273622 H.W. WILSON RECORD NUMBER: BGSA00023622  
**Effects of pollen load size and composition on pollen donor performance in wild radish, *Raphanus sativus* (Brassicaceae).**  
Marshall, Diane L

Avritt, Joy J; Shaner, Marieken  
American Journal of Botany (Am J Bot) v. 87 noll (Nov. 2000) p. 1619-27  
SPECIAL FEATURES: bibl graph tab ISSN: 0002-9122  
LANGUAGE: English  
COUNTRY OF PUBLICATION: United States  
WORD COUNT: 9439

ABSTRACT: A critical concern in the debate over the importance of sexual selection in plants is whether the nonrandom mating demonstrable in greenhouse crosses can occur in the field. Field populations likely experience smaller and more variable pollen load sizes than those that have been used in many greenhouse experiments. Therefore, we performed a greenhouse experiment in which we varied both pollen load **size** and composition in wild radish, *Raphanus sativus*, and examined the paternity of seeds. We used five maternal plants and four pairs of pollen donors. We were able to produce pollen loads of 40, 118, and 258 grains per stigma. The smallest of the pollen loads was scant enough to result in a slight, but significant reduction in seed number per fruit. While variation in pollen load composition significantly affected the proportions of seeds fathered by different donors, variation in pollen load **size** did not. The relative performance of different donors was constant across pollen load sizes, suggesting that, for this species, differential performance of pollen donors can occur at pollen load sizes that are likely to occur in field populations. Reprinted by permission of the publisher.

File 9:Business & Industry(R) Jul/1994-2002/Feb 01  
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(c) 2002 ProQuest Info&Learning  
File 636:Gale Group Newsletter DB(TM) 1987-2002/Feb 04  
(c) 2002 The Gale Group

| Set | Items   | Description             |
|-----|---------|-------------------------|
| S1  | 88      | RADISH()SEED?           |
| S2  | 1981791 | SIZE                    |
| S3  | 2960560 | AVERAGE                 |
| S4  | 286194  | MILLIMETER? OR MM       |
| S5  | 0       | S1 AND S2 AND S3        |
| S6  | 1       | S1(10N)S2               |
| S7  | 0       | S1(10N)S3               |
| S8  | 21      | S1/TI,LP                |
| S9  | 4       | S8 AND (S2 OR S3 OR S4) |
| S10 | 4       | RD (unique items)       |
| S11 | 3       | S10 NOT S6              |

6/9/1 (Item 1 from file: 285)  
DIALOG(R) File 285:BioBusiness(R)  
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00109913

PHYSICO-CHEMICAL CHARACTERISTICS OF RADISH SEED AS INFLUENCED BY  
NITROGEN FERTILIZATION, PLANT SPACING AND SIZE OF STECKLING.

Sharma S K; Lal G

HIMACHAL PRADESH KRISHI VISHWA VIDYALAYA, PALAMPUR, HIMACHAL PRADESH 176  
062.

Indian Journal of Agricultural Sciences Vol.57, No.9, p.672-674, 1987.

ISSN: 0019-5022

DOCUMENT TYPE: Article

LANGUAGE: English RECORD TYPE: Citation

DESCRIPTORS: RAPHANUS SATIVUS; CROP INDUSTRY; AGRICULTURE

SUBJECT CODES & NAMES: 60500 -- PLANT GROWTH & GROWTH SUBSTANCES; 60600

-- PLANT NUTRITION; 60700 -- PLANT REPRODUCTION; 62200 -- CROP PRODUCTION

; 63100 -- VEGETABLE CROPS

11/3,AB,K/1 (Item 1 from file: 20)  
DIALOG(R)File 20:Dialog Global Reporter  
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15308796

**Movie Filming in Tarrant County, Texas, Reels In Millions for Local Economy**  
Jenni Smith  
KRTBN KNIGHT-RIDDER TRIBUNE BUSINESS NEWS (DALLAS MORNING NEWS - TEXAS)  
February 23, 2001  
JOURNAL CODE: KDMN LANGUAGE: English RECORD TYPE: FULLTEXT  
WORD COUNT: 770

KELLER, Texas--Kim Burrow took her time Thursday helping a customer pick out bean, cucumber and **radish seeds** for his garden. It was a typical morning at Keller Feed Store, where business finally has returned to normal after a two-week invasion by Hollywood.

Northeast Tarrant County has been one of the principal sites for the filming of Servicing Sara, a romantic comedy starring model-turned-actress Elizabeth Hurley and Friends star Matthew Perry.

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... Texas--Kim Burrow took her time Thursday helping a customer pick out bean, cucumber and **radish seeds** for his garden. It was a typical morning at Keller Feed Store, where business finally...

... 1.7 billion spent on movie and TV productions in Texas, Mr. Burke said.

On **average**, film crews patronize about 300 businesses where the movie is shot, Mr. Burke said. And...

11/3,AB,K/2 (Item 1 from file: 285)  
DIALOG(R)File 285:BioBusiness(R)  
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00203910

**BACTERIA IN THE GUT DETERMINES THE SUPERCOOLING POINT OF DIAMONDBACK MOTH, PLUTELLA XYLOSTELLA, PUPAE REARED ON GERMINATING RADISH SEEDS (RAPHANUS SATIVUS VAR. ACANTHIFORMIS MAKINO).**

Kaneko J; Kita K; Tanno K  
HOKKAIDO NATL. AGRICULTURAL EXPERIMENT STATION, HITSUJIGAOKA, TOYOHIRA-KU, SAPPORO 004, JAPAN.  
Japanese Journal of Applied Entomology and Zoology Vol.33, No.2, p.82-91, 1989.

**ABSTRACT:** The supercooling point in diamondback moth, *Plutella xylostella*, pupae collected from cabbage field was about -20.degree. C. When this sample was reared on germinating radish seeds (*Raphanus sativus* L. var. *acanthiformis* Makino) at 25 .+-. 1.degree. C under 9L-15D conditions, high supercooling points (-5 to -12.degree. C) were observed in some individuals. The incidence of individuals with high supercooling points grew higher after being cooled at 5.degree. C for 5 days (pre-cooling). Changes of water and trehalose weight in pupae were slight during pre-cooling. Supercooling points of haemolymph and fat body of pupae did not change before and after pre-cooling, always maintaining low temperatures (about -20.degree. C). When the pre-cooled pupae which showed high supercooling points at the first measurement were heated in 80-90.degree. C water for 5 minutes, the supercooling point was invariably lower at the second measurement. Various **size** and type of bacteria were detected in the gut of the radish seed-reared pupae. No pupae obtained from aseptic rearing on germinating radish seeds showed high supercooling points, even after pre-cooling. These results suggest that there may be ice nucleating bacteria within the gut of diamondback moth pupae reared on

germinating radish seeds.

...THE GUT DETERMINES THE SUPERCOOLING POINT OF DIAMONDBACK MOTH, PLUTELLA  
XYLOSTELLA, PUPAE REARED ON GERMINATING RADISH SEEDS (RAPHANUS  
SATIVUS VAR. ACANTHIFORMIS MAKINO).

...ABSTRACT: water for 5 minutes, the supercooling point was invariably  
lower at the second measurement. Various size and type of bacteria were  
detected in the gut of the radish seed-reared pupae...

11/3,AB,K/3 (Item 1 from file: 636)  
DIALOG(R) File 636:Gale Group Newsletter DB(TM)  
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03892484 Supplier Number: 50042954

**BRIEF NOTES**

Food Chemical News, v40, n7, pN/A

April 6, 1998

Language: English Record Type: Fulltext

Document Type: Newsletter; Trade

Word Count: 1672

(USE FORMAT 7 FOR FULLTEXT)

**TEXT:**

...it will be good for the consumer and the industry." Japan has linked  
U.S. radish seeds with a 1997 E. coli O157:H7 outbreak that sickened  
about 120 people, The Washington...

... after the trial, an indication of clotting. The grape juice reduced  
platelet stickiness by an average of 84%, more than what has previously  
been reported for aspirin. Grapefruit and orange juice...



|   | Type | Hits | Search Text                                                                                                                                                                                                                                                                                                                                                                     | DBs   | Time Stamp       |
|---|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------|
| 1 | IS&R | 23   | (("5509963") or ("5512101") or ("5660630") or ("5697558") or ("5645093") or ("5609684") or ("5910281") or ("5706602") or ("5787824") or ("5701700") or ("5840121") or ("5902398") or ("5906732") or ("5728217") or ("5830271") or ("5728218") or ("5783250") or ("5725662") or ("5791084") or ("6112457") or ("5866193") or ("6048571") or ("6261371")).PN.                     | USPAT | 2002/01/31 10:52 |
| 2 | BRS  | 0    | ((("5509963") or ("5512101") or ("5660630") or ("5697558") or ("5645093") or ("5609684") or ("5910281") or ("5706602") or ("5787824") or ("5701700") or ("5840121") or ("5902398") or ("5906732") or ("5728217") or ("5830271") or ("5728218") or ("5783250") or ("5725662") or ("5791084") or ("6112457") or ("5866193") or ("6048571") or ("6261371")).PN.) and 'refrigerate' | USPAT | 2002/01/31 10:53 |
| 3 | BRS  | 0    | ((("5509963") or ("5512101") or ("5660630") or ("5697558") or ("5645093") or ("5609684") or ("5910281") or ("5706602") or ("5787824") or ("5701700") or ("5840121") or ("5902398") or ("5906732") or ("5728217") or ("5830271") or ("5728218") or ("5783250") or ("5725662") or ("5791084") or ("6112457") or ("5866193") or ("6048571") or ("6261371")).PN.) and 'refrigerat'  | USPAT | 2002/01/31 10:53 |

| Type   | Hits  | Search Text                                                                                                                                                                                                                                                                                                                                                                      | DBs                      | Time Stamp       |
|--------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|
| 4 BRS  | 1     | ((("5509963") or ("5512101") or ("5660630") or ("5697558") or ("5645093") or ("5609684") or ("5910281") or ("5706602") or ("5787824") or ("5701700") or ("5840121") or ("5902398") or ("5906732") or ("5728217") or ("5830271") or ("5728218") or ("5783250") or ("5725662") or ("5791084") or ("6112457") or ("5866193") or ("6048571") or ("6261371")).PN.) and 'refrigerator' | USPAT                    | 2002/01/31 10:55 |
| 5 BRS  | 15    | 47/57.6 and ('refrigerate' or 'refrigerator')                                                                                                                                                                                                                                                                                                                                    | USPAT; EPO; JPO; DERWENT | 2002/01/31 13:39 |
| 6 BRS  | 96    | 47/57.6 and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')                                                                                                                                                                                                                                                                                                               | USPAT; EPO; JPO; DERWENT | 2002/01/31 15:59 |
| 7 BRS  | 43    | 71/5 and 'seed'                                                                                                                                                                                                                                                                                                                                                                  | USPAT; EPO; JPO; DERWENT | 2002/01/31 13:58 |
| 8 BRS  | 14    | (71/5 and 'seed') and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')                                                                                                                                                                                                                                                                                                     | USPAT; EPO; JPO; DERWENT | 2002/01/31 14:22 |
| 9 BRS  | 7     | (71/5 and 'seed') and 'gel'                                                                                                                                                                                                                                                                                                                                                      | USPAT; EPO; JPO; DERWENT | 2002/01/31 14:25 |
| 10 BRS | 1854  | 428/\$.ccls. and 'seed'                                                                                                                                                                                                                                                                                                                                                          | USPAT; EPO; JPO; DERWENT | 2002/01/31 14:25 |
| 11 BRS | 11673 | ('sodium alginate' or 'gum' or 'caboxymethyl cellulose') and 'seed'                                                                                                                                                                                                                                                                                                              | USPAT; EPO; JPO; DERWENT | 2002/01/31 15:56 |
| 12 BRS | 10469 | ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed'                                                                                                                                                                                                                                                                                                     | USPAT; EPO; JPO; DERWENT | 2002/01/31 15:57 |
| 13 BRS | 17058 | ((('sodium alginate' or 'gum' or 'caboxymethyl cellulose') and 'seed') or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed'))                                                                                                                                                                                                                        | USPAT; EPO; JPO; DERWENT | 2002/01/31 14:40 |

|    | Type | Hits | Search Text                                                                                                                                                                                                                                                             | DBs                         | Time Stamp       |
|----|------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
| 14 | BRS  | 61   | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and 'refrigerate'                                                                                           | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 14:52 |
| 15 | BRS  | 3860 | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')                                                  | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 14:42 |
| 16 | BRS  | 695  | (((((sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and ('coat' or 'encapsulate')                  | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 14:43 |
| 17 | BRS  | 35   | (((((sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and ('coat' or 'encapsulate')) and 'germinate' | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 14:43 |
| 18 | BRS  | 640  | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerated')                                                                       | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 14:58 |

| Type   | Hits | Search Text                                                                                                                                                                                                                                                                         | DBs                         | Time Stamp       |
|--------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
| 19 BRS | 11   | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerated')) and ('pelletize' or 'pelletized')                                                | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 14:58 |
| 20 BRS | 336  | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and ('coat' or 'encapsulate')) and 'plant'                  | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:04 |
| 21 BRS | 26   | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and ('coat' or 'encapsulate')) and 'plant') and 'germinate' | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:04 |
| 22 BRS | 389  | ((('sodium alginate' or 'gum' or 'cboxymethyl cellulose')) and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and ('coat' or 'encapsulate')) and 'plant'                  | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:04 |

|    | Type | Hits | Search Text                                                                                                                                                                                                                                                                           | DBs                         | Time Stamp       |
|----|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
| 23 | BRS  | 32   | (((((('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed' ) or (('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and ('coat' or 'encapsulate')) and 'plant') and 'germinate' | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:04 |
| 24 | BRS  | 28   | 47/dig.9.ccls. and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')                                                                                                                                                                                                             | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:15 |
| 25 | BRS  | 0    | (47/dig.9.ccls. and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and 'pelletize'                                                                                                                                                                                           | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:18 |
| 26 | BRS  | 0    | (47/57.6 and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and 'pelletize'                                                                                                                                                                                                  | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:18 |
| 27 | BRS  | 0    | (47/dig.9.ccls. and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and 'pelletized'                                                                                                                                                                                          | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:18 |
| 28 | BRS  | 2    | (47/57.6 and ('refrigerate' or 'refrigerator' or 'chill' or 'cool')) and 'pelletized'                                                                                                                                                                                                 | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:18 |
| 29 | IS&R | 678  | ((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.                                                                                                                                                                                                                     | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:56 |
| 30 | BRS  | 115  | ((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed'                                                                                                                                             | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:56 |
| 31 | BRS  | 77   | ((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed'                                                                                                                                   | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 15:59 |

|    | Type | Hits | Search Text                                                                                                                                                                                                                                                                                                                                                                                                                | DBs                         | Time Stamp       |
|----|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
| 32 | BRS  | 137  | ((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed' ) or (((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )                                                                                                                      | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 16:28 |
| 33 | BRS  | 26   | ((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed' ) or (((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'refrigerated' or 'chill' or 'cool')                                        | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 16:14 |
| 34 | BRS  | 11   | ((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed' ) or (((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")).CCLS.) and ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and ('refrigerate' or 'refrigerator' or 'refrigerated' or 'chill' or 'cool')) and ('gel' and ('capsule' or 'coat')) | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 16:23 |

|    | Type | Hits | Search Text                                                                                                                                                                                                                                                                                                                                                   | DBs                         | Time Stamp       |
|----|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
| 35 | BRS  | 9    | 'seed preservation'                                                                                                                                                                                                                                                                                                                                           | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 16:27 |
| 36 | BRS  | 55   | (((((("47/57.6") or ("47/dig.9.ccls.")<br>or ("47/dig.11.ccls.")))).CCLS.) and<br>( 'sodium alginate' or 'gum' or<br>'cboxymethyl cellulose') and 'seed' )<br>or (((("47/57.6") or<br>("47/dig.9.ccls.") or<br>("47/dig.11.ccls.")))).CCLS.) and<br>( 'pectin' or 'gelatin' or<br>'carrageenan' or 'sodium<br>polyacrylate') and 'seed' )) and<br>'germinate' | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 16:38 |
| 37 | BRS  | 26   | (((((("47/57.6") or ("47/dig.9.ccls.")<br>or ("47/dig.11.ccls.")))).CCLS.) and<br>( 'sodium alginate' or 'gum' or<br>'cboxymethyl cellulose') and 'seed' )<br>or (((("47/57.6") or<br>("47/dig.9.ccls.") or<br>("47/dig.11.ccls.")))).CCLS.) and<br>( 'pectin' or 'gelatin' or<br>'carrageenan' or 'sodium<br>polyacrylate') and 'seed' )) and<br>'dark'      | USPAT; EPO; JPO;<br>DERWENT | 2002/01/31 16:38 |

|    | Type | Hits | Search Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DBs                      | Time Stamp       |
|----|------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|
| 38 | BRS  | 16   | (((((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")))).CCLS.) and ('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed' ) or (((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")))).CCLS.) and ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and 'dark') not (((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")))).CCLS.) and ('sodium alginate' or 'gum' or 'cboxymethyl cellulose') and 'seed' ) or (((("47/57.6") or ("47/dig.9.ccls.") or ("47/dig.11.ccls.")))).CCLS.) and ('pectin' or 'gelatin' or 'carrageenan' or 'sodium polyacrylate') and 'seed' )) and 'germinate') | USPAT; EPO; JPO; DERWENT | 2002/01/31 16:38 |
| 39 | IS&R | 3    | ((("3651772") or ("5732505") or ("4336669")).PN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | USPAT                    | 2002/01/31 16:45 |
| 40 | BRS  | 0    | 47/\$.ccls. and 'light germinator'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | USPAT; EPO; JPO; DERWENT | 2002/02/04 09:15 |
| 41 | BRS  | 0    | 47/\$.ccls. and ('light' near 'germinator')                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | USPAT; EPO; JPO; DERWENT | 2002/02/04 09:16 |
| 42 | BRS  | 6    | 47/\$.ccls. and ('light' near 'germinate')                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | USPAT; EPO; JPO; DERWENT | 2002/02/04 09:20 |
| 43 | BRS  | 135  | 47/\$.ccls. and 'radish'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | USPAT; EPO; JPO; DERWENT | 2002/02/04 09:20 |
| 44 | BRS  | 71   | (47/\$.ccls. and 'radish') and 'light'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | USPAT; EPO; JPO; DERWENT | 2002/02/04 09:43 |
| 45 | IS&R | 1    | ("5701700").PN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | USPAT                    | 2002/02/04 09:43 |



|    | Type | Hits | Search Text                                                        | DBs   | Time Stamp       |
|----|------|------|--------------------------------------------------------------------|-------|------------------|
| 46 | BRS  | 5    | ("4806357"   "4808430"   "5080925"  <br>"5254358"   "5334229").PN. | USPAT | 2002/02/04 09:43 |

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All white for use year round.



#### Burpee White Radish.

Stays mild and crisp for a long time. Best eaten when they are 1" across.



#### Champion Radish.

Stays crisp and delicious without becoming pithy.



#### Cherry Belle Radish.

All-America Winner. Extra-early, retains fine eating quality all season.



#### Cherry Bomb II Radish.

NEW! Bursting with flavor, this hybrid will have them coming back for seconds.

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#### Crimson Giant Radish.

Solid white flesh is firm, crisp and mild.



#### Easter Egg II Blend Radish.

Oval radishes, 1-1/2" across, in shades of purple, lavender, pink, rose, scarlet, white.



#### French Breakfast Radish.

Oblong roots, 1-3/4" long, 3/4" wide. Scarlet skin, shades to white at base.



#### French Dressing Radish.

NEW! A delicious French-type radish that's perfect as a salad topper.



#### Long Black Spanish Radish (Heirloom).

The skin is absolutely black; inside it's juicy and pure white.

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#### Salad Rose Radish.

A great salad or beer radish-peppery, but it won't repeat on you.



#### Sprouting Seeds.

The five most popular seeds for quick, healthful sprouting.



#### Summer Cross Hybrid Radish.

Giant white Oriental type. Spring or fall crop.



#### White Icicle Radish (Mild).

Crisp white flesh has a tantalizing, mild pungency.

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# Vegetables

## French Breakfast Radish



**Oblong roots, 1-3/4" long, 3/4" wide. Scarlet shades to white at base.**

23 days. Oblong roots, 1-3/4" long, 3/4" wide. Scarlet skin, at base. White flesh is crisp and mildly pungent when young to grow, radishes are best in cool weather. Sows about a 15 100'. New gardeners-try Burpee's Radish Seed Tapes! Sun.

Select Option:

| ITEM#  | ITEM DESCRIPTION   | PRICE  |
|--------|--------------------|--------|
| 50468A | 1 Pkt. (400 seeds) | \$1.95 |


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- \* Artichokes(1)
- \* Arugula(2)
- \* Asparagus(1)
- \* Beans(41)
- \* Beets(10)
- \* Broccoli(5)
- \* Broccoli Raab(1)
- \* Brussel Sprouts(2)
- \* Cabbage(11)
- \* Cantaloupe(11)
- \* Carrots(15)
- \* Cauliflower(2)
- \* Chard(3)
- \* Collections(3)
- \* Corn(31)
- \* Cucumbers(26)
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- \* Endive(3)


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# Vegetables

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## Vital Stats: Salad Rose Radish

Although among the easiest and fastest vegetables to grow, radishes can be overwhelming. Every seed in a generous packet sprouts and very shortly literally hundreds of radishes are demanding harvest. If a few radishes sliced into a salad or carved into rosettes as a garnish seem to exhaust their culinary possibilities, get ready to discover new and unusual ways to prepare lots of these tangy springtime favorites.

Radishes are perfect for new and especially young gardeners. For impatient kids looking for quick rewards, radishes are as close as they can come to instant gratification. Radishes are so fast growing your children will be pulling the succulent roots in as few as 21 days from sowing! Some gardeners wouldn't think of picking up a hoe without putting a packet of radishes in their shirt pocket. Dropping seeds among slower growing vegetables means double harvests—radishes first, broccoli later.

There are two basic types of radishes—spring and winter. The crunchy spring varieties, 'Cherry Bomb', 'Champion', 'Burpee White', and 'Crimson Giant' should be planted in early spring to mature as quickly as possible in cool weather for the best production and quality. Most spring varieties mature in less than a month.

Winter radishes such as 'China Rose' and 'Long Black Spanish' require a longer growing period but are superior to spring types in many ways. They hold their quality in the garden longer, store better, and have a more distinctive flavor. By growing a number of varieties from both types, you can be harvesting radishes throughout the spring, and again in the fall and winter.

Although radishes are easy to grow, knowing when to harvest is the key to perfect radishes with crisp roots and mild flavor instead of hot as fire and as pithy as corks. For the best radishes, plant them in a friable soil when the weather is cool and provide constant moisture. Because the spring varieties, in particular, mature rapidly, you must pull them before they pass their prime. Radishes that have been left in the garden too long will be fit only for the compost pile. The best way to determine when to harvest is to simply push back a little soil to see if a bulb has grown and then pick and taste a few. Radishes are not nutritional giants. They are a fair source of vitamin C and iron, but aren't eaten in sufficient quantity to be significant sources of either. It's their crisp taste, that extra zing they add to salad and a variety of other dishes that make radishes welcome in the kitchen.

## Plant History

Radishes probably originated in China. They are certainly revered and highly appreciated in the Orient, particularly in Japan where the long, white daikon radish is a major food. The ancient Greeks prized radishes above all root crops, even making replicas of them in gold. The root crop was a common food in Egypt long before the pyramids were built, and was popular in ancient Rome as well. The word "radish" is a derivation of the Latin word "radix," or root. Columbus and the early settlers brought radishes to America. Today, they remain a favorite crop for home gardeners because they're so easy and quick to grow.

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## Cultivation

As soon as the garden's soil is workable in the spring, put on some warm clothes and plant a first sowing of radishes. Choose a site that gets at least six hours of sun a day. Prepare a light, well-drained soil with a pH of 5.8 to 6.8 for best production. Till the soil to a depth of at least eight inches, particularly if you are planting the longer varieties like 'Summer Cross' and 'White Icicle'. Then, to sow the seeds, simply make furrows about three inches apart and plant the seeds at a depth of about 1/2 inch and cover loosely with soil.

Make small weekly sowings, trying different varieties to obtain a wide mix of radishes. Because most spring varieties mature in less than a month, succession plantings ensure a steady supply of radishes. When warm weather (65° or higher) arrives, stop sowing as radishes will not tolerate heat and will rapidly go to seed. However, in late summer, plant winter varieties as well as spring varieties for quick harvests in the fall.

When making succession sowings, keep in mind that the longer varieties of radishes tend to tolerate heat better than the short, round ones. Start in early spring with the small types ('Champion' and 'Burpee White'), followed by the blunt radishes ('French Dressing' and 'French Breakfast'), and finally plant the longer varieties ('White Icicle' and 'Summer Cross'). This way, the smaller radishes will have been harvested before summer arrives. There's no need to devote whole sections of the garden to radishes. Simply sow them in any empty spaces in a bed. Gardeners often sow quick-growing radishes in the same beds as slow-growing carrots, parsnips, and beets. The radishes are harvested before the other

## Vital

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vegetables need the space.

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### **Growing Tips**

Consider the following five tips to get the best radishes production.

??When preparing the soil, avoid fresh manure and organic materials or fertilizers high in nitrogen. An overly rich soil will encourage lush foliage at the expense of crisp, tasty roots.

??When the seedlings are about two inches tall, thin the plants to three-inch spacings. If not thinned, you're likely to end up with shriveled, inedible roots.

??Mulch the radishes with compost enriched with wood ashes. This not only keeps root maggots at bay, but also helps the soil retain moisture that could mean the difference between perfect and pitiful radishes.

??Water in moderation. If the soil is too dry, radishes will bolt and become pithy and too pungent to eat. If too wet, the roots will split and rot. Never let the soil dry out, but don't keep it mucky, either.

??Radishes are superb companion plants, particularly when used to draw aphids, flea beetles, and other pests away from peppers, squash, cukes, and other vegetables.

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### **Insects and diseases**

The worst invader of the radish patch is the root maggot. Luckily, this pest is easily avoided with a proper crop rotation. Never plant radishes in a bed that contained a cole crop in the last three years. If you incorporate plenty of wood ashes in the soil, the maggots shouldn't present a problem.

Radishes are virtually disease-free. Long radishes sometimes develop black root that produces dark spots at the bottom of the roots. If this is a persistent problem in your garden, grow only the round radish varieties.

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### **Harvest tips**

Because they mature so quickly, spring radishes should be checked frequently as they mature. The reason many gardeners fail with radishes is because they leave them in the ground too long. When mature, pull the roots whether you need them immediately or not, and cut off the leaves. Put the radishes in plastic storage bags in the vegetable crisper of the refrigerator. Use them in a week or two.

Winter radishes, on the other hand, don't mind a little neglect. Although they can be stored in moist sand in a root cellar, they keep right in the garden under a heavy straw mulch through the winter. Pull them before they show new growth in late winter or early spring. If some radishes bolt before you have a chance to harvest them, leave a few to develop seedpods. The seedpods, which look like tiny bean or pea pods, are actually quite tasty in a salad.

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### **Recipes and storage**

Radishes are more versatile in the kitchen than many gardeners realize. Besides adding crisp radishes to salads, try them sliced into stir-fries, stews, and soups. Marinate sliced radishes in vinegar, honey, and soy sauce to serve in a number of Chinese dishes. Sauté them in butter for a minute, and then serve with salt, pepper, and herbs (especially chervil) for a different and unusual side dish. Long radishes are particularly good for sautéing. Slice them diagonally to obtain larger pieces and cook quickly to retain crispiness. Grate radishes into your favorite slaws, or dice them for egg and potato salads. Winter radishes can even be pickled!

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### **Favorite varieties**

Radishes are available in many shapes, size, and colors. Here are some recommended varieties that will perform well in any home garden, spring and/or fall.

??'Cherry Belle'(22 days) An All-America Winner, this spring type is extra-early and of high quality. It is round, smooth and red with crisp white flesh.

??'Easter Egg II'(25 days) When looking for multicolored spring radishes, you can't go wrong with this blend that produces oval roots in shades of purple, lavender, pink, rose, scarlet, and white.

??'French Breakfast'(23 days) An heirloom spring variety that is oblong and attractive with three-quarters of the root a bright scarlet ending with a pure white tip. It maintains firmness better than many other spring types.

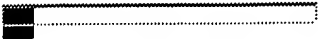
??'White Icicle'(28 days) A popular spring variety that produces cylindrical roots up to five inches long and pure white inside and out!

?? 'Summer Cross'(45 days) A giant white daikon radish that grows up to 14 inches long. It is excellent for spring or fall plantings.

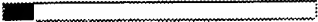
??'Salad Rose'(35 days) A Russian radish that's rosy pink and peppery flavored, growing up to eight inches long. Recommended for spring or fall plantings. ?? 'China Rose'(60 days) An heirloom winter type from Asia, produces a large, rose pink root with mildly pungent white flesh.

Try a number of radish varieties this year. They're all relatively easy to grow and have multiple uses in the kitchen. The home gardener also has a much greater choice of radish varieties to plant than can be found in any supermarket.

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# CLEMSON

## EXTENSION

Aiken, Edgefield, Newberry, Saluda Counties

# *Growing Radishes in the Home Garden*

Planting \* Cultivars \* Fertilizer \* Watering  
Cultural Production Practices \* Harvest

## *Planting*

Radishes prefer cool and moist conditions for best growth. The optimum temperature for this crop is 50-65<sup>0</sup> F. Optimum soil temperature for seed germination is 45-85<sup>0</sup> F. Radish seed will not germinate when the soil temperature is above 95<sup>0</sup>. Spring planted radishes should be harvested early. High summer temperatures cause radishes to become pithy and develop a strong flavor. Sandy to sandy loam soils are best.

Plant radish seed in rows 12-24 inches apart and place the seed 1/2 inches deep with about 1 inch between seeds. Radishes can be broadcast seeded in a 12 inch wide bed and then thinned when plants are in the 1-2 true leaf stage. Plant every 7-10 days during the recommended planting period for a continuous supply of radishes.

## PLANTING DATES

| Area     | Spring          | Fall          |
|----------|-----------------|---------------|
| Piedmont | Feb 15-March 15 | Sept 1-30     |
| Central  | Feb 1-28        | Sept 1-Oct 25 |
| Coastal  | Jan 1-March 1   | Sept 1-Nov 1  |

## *Cultivars*

*Red:* Champion, Red Prince, and Scarlet Globe.

These are cultivars that produce globe-shaped radishes. Red Prince radish is crimson red in color. Champion is a good cultivar for early spring and fall crops, but is not recommended for hot weather plantings.

*White:* White Icicle, Chinese Winter

The white radish usually has a milder flavor than the red radish. Chinese Winter radish is about 2 inches in diameter and 9-12 inches in length at maturity. The Chinese Winter radish should be thinned to 4-5 inches between plants.

### ***Fertilizer***

It is best to base fertilizer application on the results of a soil test. Collect a representative sample from the 0-12 inch depth in the garden. Mix this sample and take 1 pint of soil to the county Extension office. The sample will be sent to Clemson University for analysis. A copy of the results will be sent to you with a recommendation of how much fertilizer should be applied to the garden.

If a soil test is not taken, apply 5-10-10 at 30 pounds per 1000 square feet before planting.

### ***Watering***

Water the garden to provide a uniform moisture supply to the crop. The garden should be watered in the morning so that the foliage is dry before dark. Water sufficiently to moisten the soil to a depth a 6 inches. Light sprinklings will encourage shallow rooting of the plants. A uniform supply of water is essential for good stand establishment and good root development. Moisture stress during development of the radish will cause it to have a strong flavor and be woody or pithy.

### ***Cultural Production Practices***

Radishes planted in late spring will bolt (form a flower stalk) as the temperatures get warm in late spring and early summer. Radishes that have bolted have a strong flavor and are pithy; therefore, they should be removed from the garden.

Insect problems that may be encountered are flea beetles and aphids. Diseases are usually not a problem when this crop is grown in the home garden. Seed should be obtained from a reputable source. Rootknot nematodes may be a limited factor. Contact your county Extension office for methods to control these insects.

### ***Harvest***

Radishes will be ready to harvest in about 25-30 days after planting. This crop develops very rapidly; therefore, check the planting frequently to prevent them from becoming too large to use. The round red radish should be harvested before it is 1 inch in diameter. Larger radishes will usually have a strong flavor and will be pithy. White radishes should be harvested before they are about 3/4 inch in diameter. Radishes can be stored in the refrigerator for about 2 weeks.



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The Agriculture Program of the Texas A&amp;M University System

## Extension Horticulture Information Resource

# Easy Gardening...Radishes

Jerry Parsons and Sam Cotner, Extension Horticulturists

Texas Agriculture Extension Service

Radishes are a cool-season crop and do not do well in the hot summer months. They are grown for the root which usually is eaten raw, alone or in salads. Radishes, which can grow in partial shade, require very little room and mature quickly. They are well suited to small gardens, flower beds and containers.

### Soil Preparation and Fertilizing

Radishes need loose, well-drained soil for easy root expansion. If the soil is crusty, roots become misshapen.

Remove rocks, trash and large sticks from the planting area. Small pieces of plant material such as grass and leaves can be mixed into the soil to make it richer.

Spade the soil 8 to 12 inches deep. Turn each shovelful completely over so all plant material is covered. Scatter 1 cup fertilizer such as 10-20-10 on the soil for each 10 feet of row to be planted. Rake the soil until smooth and work up beds as shown.

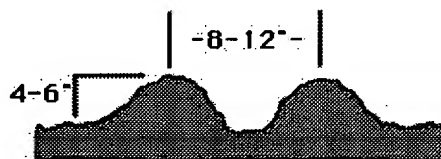


Figure 1. The 4-inch ridges are very important in low, poorly drained areas. They allow the soil to drain and let air enter the soil.

### Planting

Radishes usually are the first vegetable harvested from a spring garden. In many South Texas areas they are grown all winter. Plant them as soon as the soil can be worked in the spring.

Space ridges farther apart if the radishes are to be followed by a summer crop. Plant two or more rows of radishes on each ridge.

Using a hoe handle, stick or similar object, make a furrow 1/2 inch deep down the center of the ridge.

Plant seeds 1/2 inch deep and 1 inch apart in the row. Cover lightly with loose soil and sprinkle with water. Plants should be up in 4 to 6 days.

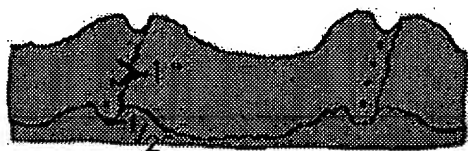


Figure 2

Begin thinning radishes when roots start expanding. Pull every other plant. Larger ones can be eaten. Those left in the row will get larger without being crowded.

Make several plantings 8 to 10 days apart for a steady supply of radishes. They will be ready for harvest about 4 to 5 weeks from planting. Ten feet of row per planting usually is enough for a family of four.

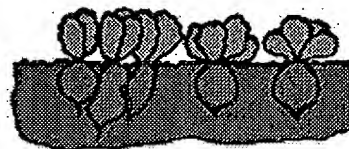
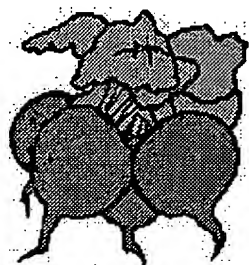


Figure 3

## Red varieties

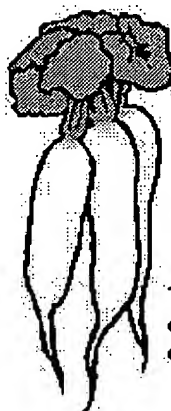
Cherry Belle, Early Scarlet Globe



Red radishes, the most popular type, are round or oval shaped.

## White varieties

Icicle, Round White



The white type can be globe shaped or long like a carrot.

### After Planting

Keep radishes free of weeds because weeds rob weak root systems of nutrients and moisture.

Scratch the soil around the plants lightly with a rake or hand too to keep the soil from crusting. Water the plants well weekly if it does not rain.

### Harvesting

Pull radishes when they are young and tender. If left in the ground too long, they get tough, hot tasting and stringy.

Pull the radishes; cut off the tops and small roots and put them in a compost pile. Wash radishes and place them in the refrigerator. They will keep 2 to 3 weeks or until the next planting is ready for harvest.






Center should be solid with no cracks.



Overmature radish with pithy or cracked center.

### Insects

| Name and description                                                                                       |                                                                                    | Control   |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------|
| <br><b>Aphid</b>          | 1/8 inch long; green, pink, red, brown, feeds on underside of leaf                 | Malathion |
| <br><b>Flea Beetle</b>    | 1/16 inch long; black, brown, striped; jumping beetles; eats small holes in leaves | Sevin     |
| <br><b>Cabbage Maggot</b> | 1/4 to 1/3 inch long; yellowish white, legless; feeds on radish root               | Diazinon  |

Before using a pesticide read the label. Always follow cautions, warnings and directions.

### Diseases

Since radishes mature so quickly, diseases usually are not a problem. If radish plants appear diseased, ask your county Extension agent or gardening assistant for help.

### Serving

Radishes are eaten raw by themselves or in salads. They are colorful, tasty and good for you.

### Clean-Up

After the radishes get too old or start going to seed, pull and place them in a compost pile if the soil is to be replanted soon. If the soil is to be left idle, old radishes and tops can be spades into the soil. This helps build the soil.

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Hypertext markup by Tammy Kohlleppel, Gretchen Eagle and Dan Lineberger.  
<http://aggie-horticulture.tamu.edu/extension/easygardening/radish/radish.html>